

The Future of Virtual Worlds

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What is a virtual World?

Literally it is an artificial environment created within cyberspace.

It is like nothing that you will see in the real world. The laws of physics and economics do not have to be obeyed in this world.

Within this world, options are unlimited



Photo credit: SecondLife



What is the history of Virtual Worlds?

1977 – First multi-user dungeon (MUD)

1984 – Neuromancer published by W. Gibson, introducing the term: "cyberspace."

1985 – Lucas Film releases "Habitat" for the Commodore 64

1992 – Book “Snow Crash” published by N. Stephenson introducing the term “Metaverse.”

1995 - Contract Consortium experiments with new apps of VWs beyond gaming such as education.

1997 – “Avatars, Exploration & Building Virtual Worlds on the Internet” published by B. Damer.

1997 – Active Worlds, a 3D VW allowing users to communicate with each other is released

1999 – Movie “The Matrix” released, introducing concept of VWs to the public

2002 – The Sims Online is launched

2003 – Second Life (SL) and There.com launched

2004 – Massively multiplayer online game (MMOG) “Final Fantasy XI” reaches a half million players

2005 – Linden Labs launch LindeX, a currency for SL. EverQuest, the first massively multiplayer online role-playing game (MMORPG) established

2006 – IBM establishes a corporate property for meetings & research and Anshe Chung has a VW new worth > 1 million.

2007 – J. Edwards establishes a campaign headquarters in a VW – the location is attached and defaced by cyber protesters.

Disney buys “Club Penguin for \$700 million

2008 – Google launches “Lively.” IBM works with SL to develop VW interoperability and with Linden Labs to deploy “enterprise ready” VWs.

What is an Avatar?

It is a person's digital representation in the VW. It can be anything – a person, robot, superhero, Greek God, cartoon character or an animal.

Once you have an avatar, buy property and have some experience, can you make money?

Yes, money is made by creating and selling virtual goods and services, but in general, it takes as much “work” to make money in a VW as in the real one.

What are Fortune 500 companies doing?

Many of them have bought VW property and have launched cyber versions of themselves in SL. Many charities and clubs also have a presence

What is “Griefing?”

This is the term for cyber-vandalism. Chung was grieved during an interview and in May 2007, the ABC Island was “cyber bombed” and completely destroyed

What is happening at the leading edge now?

SL is changing how companies design products & interact with their customers, professors train medical students, how people explore ideas, interact and have fun.

Now VWs will soon allow people to 'see their future selves', help them to understand the impact of their actions, personal choices and behaviours.

Example: By watching people burn calories on a treadmill, people are encouraged to exercise; by seeing themselves as elderly encouraged to save.

By seeing and experiencing the consequences of actions and interactions, perhaps new behaviours and decisions can be encouraged as part of wider training and rehabilitation.

VWs are serving to improve corporate internal processes. IBM and Diageo are fundamentally looking at them as an extension of the office for collaboration and new ways of working.

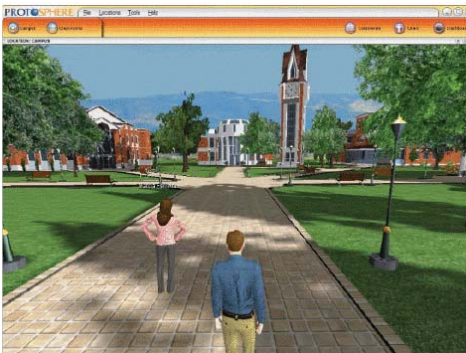


Qwaq Office combines multiple applications so they can be viewed and edited by a group.

IBM simulates project management and customer interaction in VWs

Rehearsal services in VWs provide the benefits of face-to-face rehearsals and role-playing, while saving time and travel costs because VWs are flexible in ways that reality isn't.

You can experiment with a lot of alternatives and designs, and as you start developing these rehearsal services, you can start reusing the components from one service to another



Multiverse: is different from most virtual worlds platforms in that it's just building software, which it is licensing out to other people to build their own worlds.

The first worlds built using Multiverse technology will be available to the public in the third quarter of this year, but until then Multiverse has built its own [Virtual Times Square](#) and fantasy kingdom as demo worlds.

Multiverse Business Model: Anyone can use the software and build public worlds for free, without paying so long as the developer lets users into their world for free.

If the developer charges for access to the world, Multiverse will take a 10% cut of the revenue.

The server available for free to many developers in order to build an ecosystem – to encourage end users to download and install its client -- by making many worlds available that can be accessed through the software

What are the problems?

SL is sometimes unstable, difficult to use, and users need to be running powerful PC with a fast Internet connection.

Many companies, including American Apparel, Starwood Hotels and Pontiac, have left the service. United Business Media, shut down its CMP Metaverse business.

Military Applications

The Infantry Immersion Trainer (IIT) provides a vivid and realistic virtual environment to prepare warfighters for a range of possible scenarios.

Marines utilizing the trainer emerge with a heightened ability to recognize threats and make split-second decisions in dynamic scenarios before deploying to face real combat.

IIT demonstrates the feasibility of affordable technologies to enhance joint warfighting capabilities during complex, stressful combat conditions.



IIT focuses on saving the lives of Marines and warfighters by use of scenarios are repeatable and scalable allowing participants to develop and improve necessary skill sets.

The sights, sounds, and smells of combat are reproduced in detail, abbreviating the time it takes to develop proficiency.

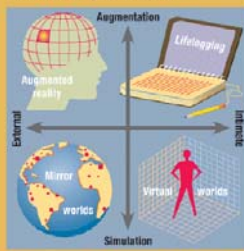
Improving mission performance through training technology is an objective the IIT program. The software-based systems enable rapid improvement of training delivery and the simulated environment can be tailored to suit mission or individual training needs.

What is the future of VWs?

It will soon be difficult to distinguish VWs from RWs. SL already has luxurious hotels on tropical islands...skydiving and skateboarding ...virtual campus including teachers and lecture rooms...virtual sex, escort agencies, red-light districts, tabledances...purchase and vending of land, real estate, cars, furniture, clothes ...3D-chat...and all the rest of it – and this is only the beginning!!!

Visions of the future

Virtual worlds are just one manifestation of the metaverse that will evolve during the next 10 years.



- **Augmented reality:** An enhancement of the physical world for the individual
- **Lifelifeling:** The recording and reporting of the states and life histories of objects and people
- **Virtual worlds:** An augmentation of the economic and social life of physical communities
- **Mirror worlds:** Reflections of the physical world

Source: Metaverse Road Map

Artificial Playmates

Children with autism are unable to sustain play or social interaction with real people.

But interaction with virtual peers releases hidden social skills in these children.

Autistic children may be more at ease with virtual playmates because the virtual children are more predictable, which could make them seem less threatening.



Extension of P2P to VWs

Visitors to virtual worlds can't be spread across different servers arbitrarily, to balance the load.



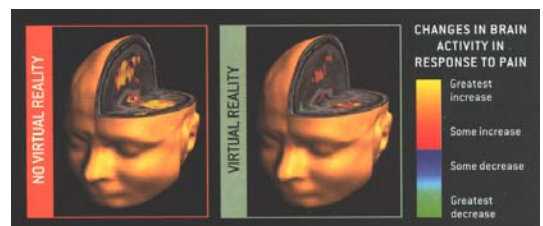
Research is now underway to use peer-to-peer network protocols – these would work best for social worlds that include a lot of user-generated content

Virtual Reality Therapy

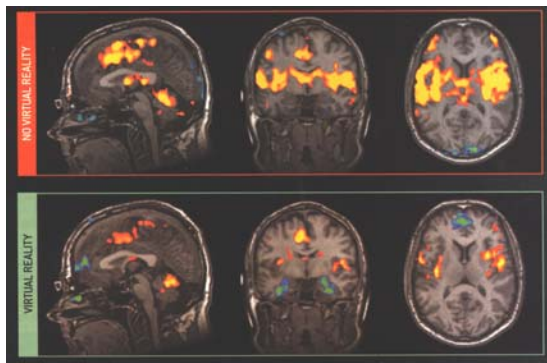
It has long been known that the best way to alleviate pain is by brain distraction

Virtual-reality (VR) immerses users in a 3-D computer generated world that is ideally suited to distracting patients from their pain

fMRI scans of the brain show that when volunteers engage in VR programs during painful stimuli, the pain-related activity significantly subsides.



Source: Scientific American August 2004



Source: Scientific American August 2004

Burn Patient uses VR program to relieve the pain of wound care. VR programs are significantly more effective than video games at distracting patients from excruciating levels of pain



Scene from the VR program “SnowWorld”, made especially for burn patients



Research Results:

Patients using traditional pain control (opioids alone) stated that the pain was almost twice as severe compared with when they were actively interacting with a stimulating VR simulation.

Phobia Therapy

VR can be used to combat phobias by exposing patients to realistic graphic simulations of their greatest fears

Like pain control programs, by altering the chemistry of the brain, exposure to the simulation changes the way people think, behave and interpret information.

Spiderworld is a VR program designed to help phobic patients overcome their fear of spiders. The system provides tactile feedback, allowing the patient to “touch” the furry virtual spiders.



Conclusion

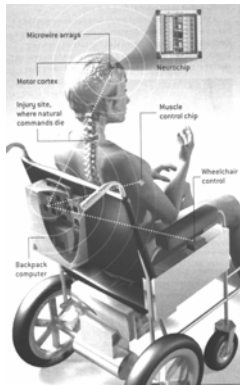
VR will help reduce the reliance on drugs and will permit more aggressive wound care and physical therapy, speeding up recovery and cutting medical costs

The rapid fall in price of high quality VR systems means that hospitals will soon be able to afford this approach to therapy.

Cyberkinetics

FDA approval received for a clinical trial of a brain implant designed to allow paralyzed patients to interact with a PC

Many types of internalizing technologies such as cochlear & optic nerve implants are converging into interactive chips that can retrieve detailed and specific info from the brain so that complex tasks can be done by thought alone



A Brain-machine interface helping a patient paralyzed by a spinal injury. Chip converts thoughts of movement into codes transmitted by RF signals to the controller backpack. Controller converts the signals into motor commands that are transmitted wirelessly to chips implanted in various muscles, allowing them to move.

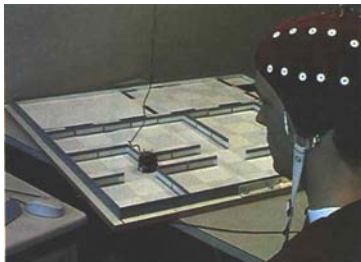
Source: Scientific American October 2002

Rat Driven Robot:

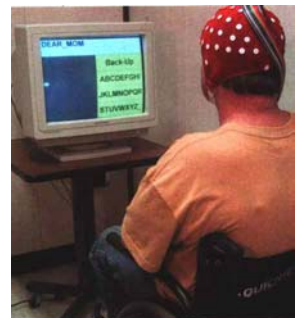
Neural signals from an electrode implanted in a rat's brain are used to control a mobile robot.



EEG Readings of thought patterns guide a miniature robot through a model house



EEG readings of thought patterns act as interface to translate a subject's thoughts into words on the computer screen



Magnetic Brain Imaging

Standard *electroencephalograph* (EEG) is inadequate for detecting localized neural activity in the brain because electrical fields are spread out and distorted as they pass through the skull

Magnetoencephalography (MEG)

Can accurately detect the faint magnetic fields generated by neural activity

The sensitivity of the MEG detector is achieved by use of a *Superconducting Quantum Interference Device* (SQUID) magnetometer that can detect magnetic fields more than 1 billion times weaker than the Earth's field

The individual SQUID readings are translated by software into a detailed schematic showing the strength of the magnetic field at each location in the brain



Patient undergoing brain analysis in a MEG unit

Source: Technology Review, Nov. 2004, p. 72

Functional Magnetic Resonance Imaging (fMRI)

Blood low in O_2 causes a slight distortion as it flows through a magnetic field. Blood high in O_2 does not.

Allows the “hyperscanning” of the brains of people carrying out daily activities.

Resolution has progressed from 1 cm^3 to 1 mm^2 representing $\sim 100,000$ neurons.

Goals of present research:

- Understand the brain patterns associated with each specific human emotion – love, fear, humour etc...
- Learn about the neurology of decision making
- Development of the new science of neuro-economics

Magnetic Brain Stimulation

Transcranial magnetic stimulation (TMS) uses pulses of magnetic energy to induce electric currents in pacific brain regions

A powerful magnet over the frontal regions of the skull and delivers magnetic pulses

Treatment alters the biochemistry and firing patterns of the neurons in the cortex

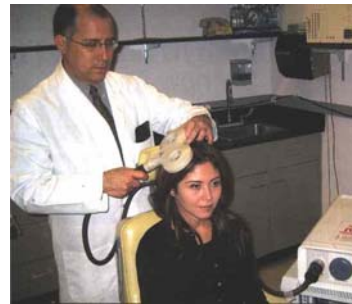
The therapy can be fine tuned by adjusting location, intensity and pulse frequency

Typical treatment induces an electric field of 500 V/m in the cortical region near the instrument

Thousands of military personnel suffer from various forms of PTSS and clinical depression that does not respond well to conventional antidepressants (Prozac, Zoloft).

TMS may offer hope for an effective treatment of the suffering of these individuals

Researcher delivers magnetic pulses to the brain to generate instant happiness and well being



Source: Technology Review, March 2004

Internet 2

The new all optical Internet will have from 10,000 to 100,000 times the capacity of Internet 1.

The result will be hyper-realistic avatars that will be able to interact with others in ways that will be indistinguishable from living beings

The ultimate experience will be a “full sensual immersion” so that the user will be unable to distinguish reality from digital reality

